

## Coordinated Efforts Provide Enabling Knowledge to Advance SSL Technology

To accelerate solid-state lighting (SSL) technology developments, the U.S. Department of Energy leverages the strengths and capabilities of the Office of Science and the Office of Energy Efficiency and Renewable Energy (EERE).

- The Basic Energy Sciences (BES) program within the Office of Science conducts basic research to advance fundamental understanding of materials behavior, with the goal of impacting future directions in applied research and technology development.
- EERE's SSL portfolio guides technology advances from laboratory to marketplace with a comprehensive approach that includes Core Technology Research, Product Development, Commercialization Support, and Standards Development. Core Technology Research focuses on applied research for technology development, with the goal of meeting performance and cost targets.

Through coordination and collaboration, these DOE research programs are working together to provide the scientific foundation for new forms of lighting.

### DOE SSL RESEARCH

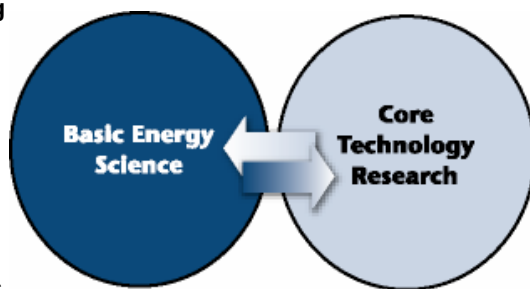
#### Basic Research to Advance Fundamental Understanding

##### **Focus**

Basic scientific questions underlying materials behavior

##### **Deliverables**

Knowledge of physical, chemical, and materials sciences that enables development of new synthesis techniques and novel materials  
Characterization capabilities to support these investigations



#### Applied Research for Technology Development

##### **Focus**

Technical targets for performance and cost

##### **Deliverables**

Materials and components for SSL technologies that meet efficiency, performance, and cost targets



U.S. Department of Energy

**Energy Efficiency and Renewable Energy**

Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

## **Basic Research Advances Fundamental Understanding**

BES projects focus on basic scientific questions that underlie DOE mission needs. These projects target principles of physics, chemistry, and the materials sciences, including knowledge of electronic and optical processes that enable development of new synthesis techniques and novel materials. BES encourages the development of results from its experimental and theoretical research programs and user facilities that will impact future directions in applied research and technology development. Project results often have multiple applications, including SSL.

## **Core Technology Research Focuses on Technical Targets**

EERE's SSL portfolio draws on its long-term relationships with the SSL industry and research community, using a series of ongoing, interactive workshops to refine an extensive R&D agenda. This approach ensures that DOE funds the appropriate research topics that will improve efficiency and move SSL into the market. Input from these workshops helps to shape research priorities and the development of solicitations. Core Technology Research projects focus on applied research for technology development, with particular emphasis on improving the performance and durability of materials and components, as well as cost reduction.

## **DOE Drives Emphasis on Energy Efficiency**

DOE's support of SSL is essential to ensure the development of *energy-efficient* SSL technology—an emphasis that, without DOE leadership, might be lost on the path to commercialization. The Department's involvement in SSL technology development pushes industry to higher levels of efficiency than they might otherwise achieve.

The Department's support also maintains our nation's technology leadership. While projected energy savings are significant, high-efficiency white-light sources represent a somewhat risky investment that industry is unlikely to fund exclusively. If our nation is to maintain its leadership position in SSL technology development, the U.S. must meet or exceed other countries' commitment to SSL initiatives. The results from DOE's collaborative projects will ultimately deliver substantial energy savings and position U.S. companies as global leaders in new lighting products, systems, and service markets.